

What is claimed is:

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1. An image processing apparatus including:
first determination means for determining whether or
not a pixel included in an image is a color pixel;

5 means for dividing the image into a plurality of
blocks;

counting means for counting the number of color pixels
for each block; and

10 second determination means for determining whether or
not the image is a color image based on the counting result
by the counting means.

2. An image processing apparatus of claim 1 further
including third determination means for determining whether
or not said each block is a color block, respectively, based
on the number of color pixels for each block, wherein the
second determination means determines whether or not the
image is a color image based on the determination result by
the third determination means.

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3. An image processing apparatus of claim 2, wherein
the third determination means determines a block as a color
block in case color pixel ratio which is ratio of the number
of color pixels to that of entire pixels in the block exceeds
25 a first threshold.

Sub B2 7 4. An image processing apparatus of claim 3 further

including fourth determination means for determining whether or not a block has a feature of a specified color, wherein the third determination means determines a block which has the feature as a color block in case the color pixel ratio exceeds a second threshold which is lower than the first threshold.

5. An image processing apparatus of claim 4, wherein the fourth determination means creates intensity histograms for the three primary colors included in each block as respective color data and determines whether or not the block is a block which has a feature of a specified color based on intensity distributions indicated in the intensity histograms for the three primary colors.

6. An image processing apparatus of claim 5, wherein the fourth determination means determines a target block as a block having a feature of a specified color in case, as to the target block, intensity distribution of the specified color falls within first range in intensity histogram set for the specified color and intensity distributions of the other two colors fall within second range in intensity histograms set for the other two colors;

the fourth determination means determines the target block as a block without a feature of the specified color in case at least one of the three colors does not fall within its corresponding intensity range; and

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7 13. An image processing apparatus of claim 3, wherein
the second determination means determines an image as a color
image irrespectively of the determination results for the
5 other blocks by the third determination means in case a block
having a color pixel ratio exceeding the fourth threshold
higher than the first threshold is discovered.

10 14. An image processing apparatus of claim 13 further
including means for adjusting the fourth threshold.

15 15. An image processing apparatus of claim 2, wherein
the third determination means determines a block as a color
block in case the number of color pixels within a block
exceeds fifth threshold.

20 16. An image processing apparatus of claim 2, wherein
the second determination means determines an image as a color
image irrespectively of the determination results for the
other blocks by the third determination means in case the
third determination means determines a block on a certain
portion as a color block.

25 17. An image processing apparatus of claim 16 further
including means for designating the block on the certain
portion.

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5 image exceeds sixth threshold.
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including means for adjusting the sixth threshold.

10 20. An image processing apparatus of claim 18, wherein
the second determination means counts the number of color
blocks putting a predetermined weight on the block on the
certain portion.

15 21. An image processing apparatus of claim 20 further
including means for designating the block on the certain
portion.

22. An image processing apparatus of claim 2, wherein
the second determination means determines an image as a color
image in case the number of color blocks included in the
image exceeds seventh threshold.

23. An image processing apparatus of claim 1, wherein
25 the second determination means determines an image as a color
image in case a block having color pixels which exceeds
eighth threshold in number is discovered.

24. An image processing apparatus of claim 1 further including group processing means for summing up the number of color pixels for a block group consisting of a plurality of blocks adjacent to one another, wherein the second determination means determines whether or not an image is a color image based on the group processing result.

25. An image processing apparatus of claim 24 further including fifth determination means for determining whether or not a target block is a color block based on the number of color pixels for the block group which includes the target block, wherein the second determination means determines whether or not the image is a color image based on determination result by the fifth determination means.

26. An image processing apparatus of claim 25, wherein the fifth determination means determines a target block as a color block in case group color pixel ratio which is ratio of the number of color pixels to the number of all pixels in the block group represented by the block exceeds ninth threshold.

27. An image processing apparatus of claim 26 further including means for adjusting the ninth threshold.

28. An image processing apparatus of claim 24, wherein the second determination means determines an image as a color

image in case a block group whose color pixels as total of the group exceed tenth threshold in total as the group is discovered.

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29. An image processing apparatus of claim 1, wherein the second determination means excludes a block on a certain portion from the determination.

10 30. An image processing apparatus of claim 29, wherein the certain portion includes peripheral portions of an image.

15 31. An image processing apparatus of claim 29, wherein the certain portion includes image folding portions on an original in the form of a book.

32. An image processing apparatus of claim 1 further including means for correcting the counting result of the number of color pixels for a specified block on a certain portion.

20 33. An image processing apparatus of claim 32, wherein the certain portion includes peripheral portions of an image.

25 34. An image processing apparatus of claim 32, wherein the certain portion includes image folding portions on an original in the form of a book.

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35. An image processing apparatus of claim 1, wherein the second determination means determines whether or not an image is a color image even if the numbers of color pixels for blocks are not completely counted, and the counting means for counting the number of color pixels for each block stops counting operation after the second determination means completes color image determination.

36. An image processing apparatus of claim 1, wherein the first determination means determines a pixel as a color pixel in case saturation of the pixel exceeds eleventh threshold.

37. An image processing apparatus of claim 36, wherein eleventh threshold for some pixels differs from eleventh threshold for other pixels.

38. An image processing apparatus of claim 37, wherein the eleventh threshold of pixels farther from the center of the image is higher than that of pixels closer to the center of the image.

39. An image processing apparatus of claim 36 further including means for adjusting the eleventh threshold.

40. An image processing apparatus of claim 1, wherein the first determination means determines a pixel as a color

pixel in case the saturation of the pixel exceeds eleventh threshold and the brightness of it is below twelfth threshold.

41. An image processing apparatus of claim 40, wherein
5 twelfth threshold for some pixels differs from twelfth threshold for other pixels.

42. An image processing apparatus of claim 41, wherein
10 the twelfth threshold of pixels farther from the center of the image is higher than that of pixels closer to the center of the image.

43. An image processing apparatus of claim 40 further
15 including means for adjusting the twelfth threshold.

44. An image processing apparatus of claim 40, wherein
the twelfth threshold is lower than the brightness of pixels on a base portion.

20 45. An image processing apparatus including:
means for dividing an image into a plurality of blocks;
block determination means for determining whether or
not each divided block is a color block based on a
predetermined determination condition; and

25 image determination means for determining whether or
not the image is a color image based on the determination
result by the block determination means.

46. An image processing apparatus of claim 45 further including specified-color block determination means for determining whether or not a block has a feature of a specified color, wherein the block determination means changes the determination condition for blocks which have a feature of the specified color.

47. An image processing apparatus of claim 45, wherein the block determination means changes the determination condition for blocks on a certain portion.

48. An image processing apparatus of claim 45, wherein the block determination means changes the determination condition according to the divided block.

49. An image processing apparatus of claim 45, wherein the image determination means determines an image as a color image irrespectively of the determination results for the other blocks in case the block determination means determines a block on a certain portion as a color block.

50. An image processing apparatus of claim 45, wherein the image determination means determines an image as a color image in case a color block ratio which is the ratio of the number of color blocks to all of the blocks included in the image exceeds predetermined standard value.

51. An image processing apparatus of claim 45, wherein the image determination means excludes a block on the certain portion from the determination.

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52. An image forming apparatus including:
 means for inputting an image;

first determination means for determining whether or not a pixel included in the input image is a color pixel;

10 means for dividing the image into a plurality of blocks;

counting means for counting the number of color pixels for each block;

15 second determination means for determining whether or not the image is a color image based on the counting result by the counting means; and

printing means performing color-printing in case the second determination means determines the image as a color image, and performing monochrome-printing in case the second
 20 determination means determines the image as a non-color image.

53. An image forming apparatus of claim 52, wherein the means for inputting an image is an image reader in which means of provisional scanning fetches the image for color
 25 image determination.

54. An image forming apparatus including:

means for inputting an image;

means for dividing the image fetched by the means for inputting an image into a plurality of blocks;

block determination means for determining whether or
 5 not a divided block is a color block based on a predetermined determination condition for each block;

image determination means for determining whether or
 not the image is a color image based on the determination
 result by the block determination means; and

10 printing means performing color-printing in case the
 second determination means determines the image as a color
 image, and performing monochrome-printing in case the second
 determination means determines the image as a non-color image.

15 55. An image forming apparatus of claim 54, wherein the
 means for inputting an image is an image reader in which
 means of provisional scanning fetches the image for color
 determination.

20 47037 56. Color image determination method including:
 step of determining whether or not pixels included in
 an image are color pixels, respectively;
 step of dividing the image into a plurality of blocks;
 step of counting the number of color pixels for each
 25 block; and
 step of determining whether the image is a color image
 based on the counting result.

57. Color image determination method including:
- step of dividing an image into a plurality of blocks;
 - step of determining whether or not a block is a color
- 5 block based on a predetermined determination condition for each block; and
- step of determining whether or not the image is a color image based on the determination result for each block.

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